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TATUIDRIS, A REMARKABLE NEW GENUS OF FORMICIDAE (HYMENOPTERA)

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INTRODUCTION

The two remarkable ant specimens we describe below were sent to us originally by Mr. R. R. Snelling of the Los Angeles County Museum of Natural History in California. After prolonged study, we concluded that they represent a genus and species of Myrmicinae certainly very unlike any ants previously described, and that they could not reasonably be included in any living formicid tribe so far known. True, this new ant shares some striking habitus characters with certain Dacetini (*Glomyrmex*, *Gynomyrmex*), and also with the anomalous *Phalacromyrmex* (Kempf 1960), but analysis of these similarities indicates to us that they are mostly convergent and not based on close phylogenetic relationship.

In addition to comparisons with living ant genera, we checked through some likely fossil groups. Our attention soon came to rest on the primitive myrmicine genus *Agroecomyrmex*, of the Oligocene Baltic Amber (Wheeler 1914). We believe that our new genus and *Agroecomyrmex*, while at first sight very unlike each other, are nevertheless linked by some fundamental resemblances that we shall cite below in the tribal diagnosis and ensuing discussion. In fact, we feel that the two genera should be placed together in the same tribe. This tribe is already available in Carpenter's (1930) *Agroecomyrmicini*, raised to receive *Agroecomyrmex* and his then new

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genus *Lithomyrmex* (later changed to *Eulithomyrmex*³) from the Miocene Florissant Shale of Colorado. The condition of the shale fossils is of course much inferior to that of amber specimens, and Carpenter was unable to make out some important characters of *Eulithomyrmex*, including the shape and position of the compound eyes, presence or absence of antennal scrobes, status of tibial spurs, etc. The venation of the queen wing, the broad head, and the form of the petiole, postpetiole and downturned gaster were enough, however, to make reasonable a placement of *Eulithomyrmex* in the same tribe as *Agroecomyrmex*. The diagnosis of the tribe offered below is based mainly on *Agroecomyrmex* and the new genus *Tatuidris*, but it is thought to agree with such characters of *Eulithomyrmex* as are known.

Tribe Agroecomyrmecini (emended)

Worker: Body short and compact, with hard, heavy integument, apparently capable of inrollment during lethargy. Head broad; eyes convex, set far back on the head, each at the posterior end of a well-marked, broad and deep antennal scrobe. Antennae robust, 7- or 12-segmented, with large apical segment. Mandibles robust, triangular. Clypeus broad, with transverse free margin. No ocelli. Alitrunk short and broad, but not as broad as head, convex above, dorsal sutures obliterated; propodeal declivity bounded by carinae with or without short teeth above. Petiole sessile, short and thick, with a prominent process beneath. Postpetiole short, deep and very broad, with the sternite well-developed; broadly attached to the first gastric segment, which is large and strongly downcurved. Remaining (apical) segments of gaster forming a cone directed downward or even anteriorly. Legs robust, with slender simple tarsal claws; middle and hind tibiae each with a pectinate apical spur.

Female (not known for the new genus): Like worker, but winged and with the other usual caste differences. Forewing venation retaining all of Rs₂-3, though M₂ is wholly contracted and lost.

³By a very unusual coincidence, Clark (1928) had preceded Carpenter by a few months in the use of the name *Lithomyrmex* for a living genus of Australian ants, now considered to be a synonym of *Amblyopone*. Clark's paper, published in Western Australia, did not reach the United States for some time, but Carpenter (1935) eventually proposed *Eulithomyrmex* as the necessary substitute for his fossil genus.

Male unknown.

The tribe Agroecomymecini occupies a basal position in subfamily Myrmicinae, and in fact it may well represent the relicts of the primitive stock connecting the Myrmicinae to the ancestral tribe Ectatommini in subfamily Ponerinae, as already proposed by Brown (1954). Like *Myrmica* and allies among the lower Myrmicinae, the Agroecomymecini have pectinate spurs on the last two pairs of



Figure 1. *Tatuidris tatusia* gen. et sp. nov., holotype worker in side view.

tibiae, but they are more primitive than *Myrmica* in the structure of the petiole, postpetiole and gaster. These characters recall the ectatommine genera *Gnamptogenys* and *Proceratium*, and the sculpture of *Agroecomymex* and *Eulithomyrmex* also matches that of various *Gnamptogenys* species-groups. The new genus *Tatuidris* is more specialized in its almost complete loss of sculpture, as it is also in other obvious ways.

The new genus affords one case in a small but growing list of insect taxa found alive only after their other representatives had already been described as fossils. The Agroecomymecini are evi-

dently a very old group, probably widespread during the early Tertiary in both hemispheres, and we may consider them as part of an early wave of the now dominant subfamily Myrmicinae that may have originated in an ectatommine stock near *Gnamptogenys*. We should expect the discovery from time to time of other fossil and living agroecomyrmecine relicts that will give us more details concerning the rise of the myrmicines.

Tatuidris, genus nov.

Worker: Size rather small, body exceedingly short and thickset. Head broad shield-shaped, narrowed in front and with strongly convex sides; convex dorsally and concave beneath; frontal carinae far apart, forming the lateral cephalic borders and the sharp upper margins of deep, long antennal scrobes. Eyes small, convex. Antennae 7-segmented, with a short, flattened-lamellate, apically broadened scape; funicular club indistinctly 2-segmented, the apical segment very large and thick. Clypeus broad, indistinctly bounded, transverse, with a sinuous, medially lamellate free margin. Mandibles heavy and robust, triangular, meeting along minutely crenulate but straight masticatory margins, each with two short, blunt teeth at apex and a massive brush of heavy setae along the inner (ventral) surface near the masticatory margin; each brush meshes with its opposite number at full closure (see Figure 3). Labrum broader than long, bilobed with a broad median excision. Maxillary palpi apparently 1-segmented; labial palpi 2-segmented.

Alitrunk remarkably short and broad, with continuously convex dorsum, forming an almost circular disc; humeri as seen in full dorsal view rounded, but vertically carinate on sides. Propodeal declivity concave, unarmed but bounded on each side by a carina; inferior propodeal plates rounded. Petiolar and postpetiolar nodes subrectangular as seen from above, the postpetiole a little wider behind than in front, its sternum large and deep, and with an anterior rim. Gaster truncate in front as seen from directly above. Sting very long and strong.

Legs robust, femora and tibiae incrassate, tibiae obliquely terminated at apex, the extensor angle briefly produced and bearing a flat pencil of stiff, curved yellow setae; these are much larger on the forelegs than on the others. On the forelegs, tarsal segments 2, 3, 4 broadly triangular, with stout, darkened plantar setae; metatarsus with a dense brush of short yellowish setae occupying nearly the

entire length of the flexor surface. On other legs, tarsal segments are mostly longer than broad.

Integument prevailingly smooth and shining, with fine, loose striation and reticulation mainly confined to the sides of the alitrunk, nodes and mandibles, and to the propodeal declivity. Pilosity fine, short to long, rather abundant. Color ferruginous.

Queen and male unknown.

Type and only known species is *Tatuidris tatusia* sp. nov., next described, from Central America.

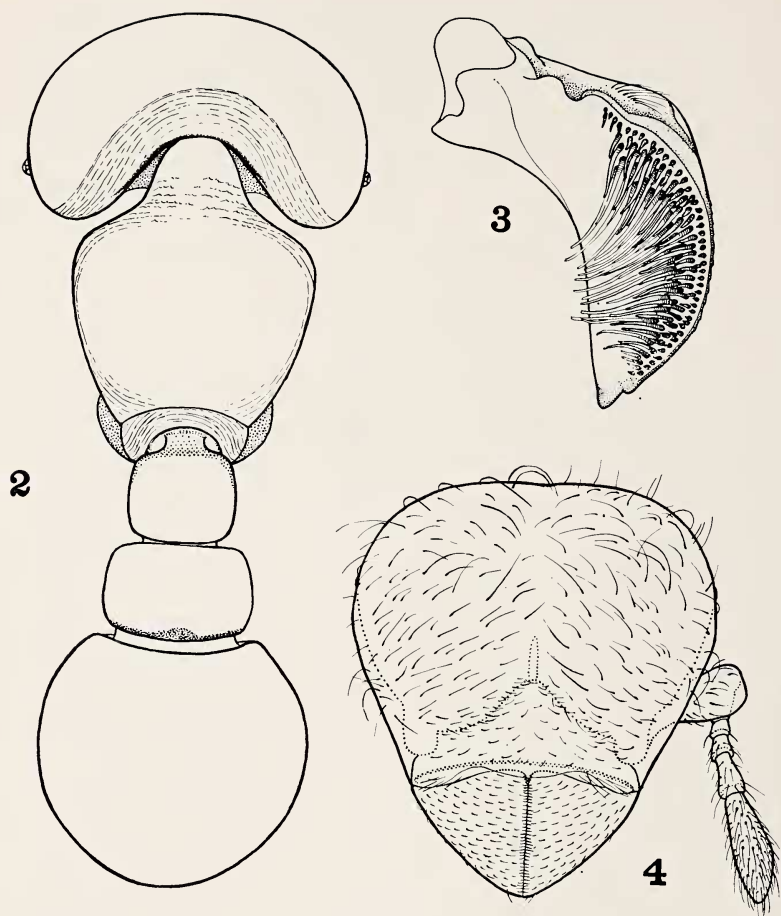
***Tatuidris tatusia*, species nov.**

(Figures 1-4)

Holotype worker: Total outstretched length, including mandibles and axial dimension of gaster to its apex, 3.5 mm. Head L 0.82, head W 0.96, L closed mandibles 0.25, diagonal (Weber's) L of alitrunk (cervix omitted) 0.78 mm. Scape L (chord to basal collar) 0.40, L terminal antennal segment 0.30 mm, which is about half of total L of funiculus. Greatest diameter of eye 0.07 mm (about 10 facets total in each eye).

The form of the body, sculpture and pilosity are indicated in the figures. The clypeal suture is obsolete, marked only by a shallow saucis in the middle, so the dotted lines in Figure 4 show only the approximate boundary. The free margin of the clypeus is concave overall, but an almost invisible, low, thin, transparent median lobe forms a median convexity in front of a darker, evenly concave internal line showing through the integument; this dark line is very prominent, and at first sight looks like the free margin proper.

The remarkable mandibular brush is shown in Figure 3; its constituent setae are thick, stiff and pigmented, short near the masticatory margin and becoming longer lateroventrad. In the closed mandibles, the brushes are visible only from ventral view. The trophi were dissected in both the holotype and paratype. The maxillary palpi were never clearly seen, but the parts assumed to represent them are extremely small and inconspicuous, albeit each with a long apical sensillum. The labial palpi consist each of 2 clavate segments with curved slender bases; the apical segment has a single apical sensillum. The foramen magnum is situated in a small funnel-shaped process extending rather prominently from the deeply excavated underside of the isolated cranium, but covered by the cervix in the entire insect. Pronotum marginate in front, but the margin becoming indis-



Figures 2-4. *Tatuidris tatusia* gen. et sp. nov., holotype and paratype workers. Fig. 2, holotype in dorsal view, pilosity omitted. Fig. 3, mandible of paratype, viewed from the midline looking laterad, to show the mandibular brush. Fig. 4, holotype, full-face view of head.

tinguishable from the sculpture in the middle, so not really seen in dorsal view (compare Figures 1 and 2).

The smooth parts of the integument bear very shallow indefinite indentations from which the setae arise, but these interfere scarcely at all with the generally polished surface. Delicately striate and reticulate areas are as shown on sides of the mandibles, posterolateral

surface of head, front and sides of alitrunk, propodeal declivity and sides of nodes. Legs predominantly smooth and shining, with fine, rather long reclinate pilosity.

Color yellowish ferruginous, thick margins, etc. often appearing more brownish or blackish.

The single paratype worker is virtually identical with the holotype, but is a trifle larger (Head L 0.83, Head W 0.99, Weber's L of alitrunk 0.80 mm).

Holotype in Los Angeles County Museum of Natural History, Los Angeles, California; paratype in Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts. Collected together 2 miles south of Quetzaltepec (Quezaltepeque), Prov. La Libertad, El Salvador, 17 July 1961, M. E. Irwin leg. The collection was made by Berlese funnel from humus, and the sample also contained specimens of a small *Solenopsis*, an undescribed species of *Eurhopalothrix*, and *Octostruma balzani*. Known only from the type collection.

The generic name comes from *Tatu*, the Tupi word and also the modern Brazilian word for the armadillos, plus the Greek-based *idris*. *Tatusia* is another old generic name for an armadillo.

Though superficially *Tatuidris* bears some resemblance to species of the dacetine *Glomyromyrmex* complex of genera and to *Phalacromyrmex fugax*, it can be separated at once by means of its 7-segmented antennae, its brush-bearing mandibles, its toothless propodeum, the form and proportions of postpetiole and gaster, and by the presence of pectinate spurs on middle and hind tibiae, among other characters. It is very strongly isolated among living ant genera, though clearly a myrmicine. From the fossil genera of the same tribe, *Agroecomyrmex* and *Eulithomyrmex*, *Tatuidris* is readily distinguished by the shape of the head, 7-segmented antennae, lack of propodeal teeth, reduced sculpture, and also by the form and probably the armament of the mandibles.

It would be extremely interesting to know the food of *Tatuidris*; the mandibular brushes and powerful sting together suggest that the ant specializes in catching some active or slippery live arthropod prey in the soil or soil cover.

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REFERENCES CITED

BROWN, W. L. JR.

1954. Remarks on the internal phylogeny and subfamily classification of the family Formicidae. *Insectes Sociaux*, 1: 21-31.

CARPENTER, F. M.

1930. The fossil ants of North America. *Bull. Mus. Comp. Zool. Harv.*, 70: 1-66, pl. 1-11.

1935. A new name for *Lithomyrmex* Carp. (Hymenoptera). *Psyche* 42: 31.

CLARK, J.

- 1928 (1927). Australian Formicidae. *J. R. Soc. W. Aust.*, 14: 30.

KEMPF, W. W.

1960. *Phalacromyrmex*, a new ant genus from southern Brazil. (Hymenoptera, Formicidae). *Rev. Brasil. Biol.* 20: 89-92.

WHEELER, W. M.

1914. The ants of the Baltic Amber. *Schrift. Phys.-ökon. Ges. Königsberg*, 55: 1-142.